

FIRST Impact Award - Team 4013

2025 - Team 4013

Team Number

4013

Team Nickname

Clockwork Mania

Team Location

Orlando, FL - USA

Describe the impact of the *FIRST* program on team participants within the last 3 years. Think about percentages of those graduating high school, attending college, in STEM careers, leadership skills, and serving as mentors/sponsors in *FIRST* programs.

FIRST has given our team valuable opportunities and connections. Last year, 21 members—nearly 50% of our team—graduated and attended schools like Georgia Tech, UF, UPenn, and Cornell, all pursuing STEM majors. This doubled the previous year's 11 graduates, five of whom chose non-STEM fields. Eight alumni, including our founder, returned to assist us. With strong parent and alumni support, we raised \$6,000 through donations, with contributions from Disney, Lockheed Martin, and Blue Origin.

Describe your community along with its unique opportunities and circumstances. Think about your geographic region, diversity of town/school, language barriers, socioeconomic barriers, and cultural expectations.

Our FIRST community at Orlando Science High School is incredibly diverse, with 80% of our team being first-generation students or recent immigrants from places like Brazil and Uzbekistan. Despite challenges, we share a strong ambition, breaking language barriers with fluency in Spanish, Arabic, Chinese, and Hindi. While resources are limited, our diversity fosters an inclusive space where students from all backgrounds engage in STEM, united by innovation, and a passion for learning.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* Mission in ways that are effective, scalable, sustainable, and creative.

Over the past 3 years, our team has hosted & attended 50+ outreach events, dedicating over 10,000+ hours to spreading FIRST globally. We run FLL summer camps both locally and abroad. We track our impact and hours through an alumni-built program that ensures outreach in Puerto Rico, Uzbekistan, and Africa is documented. Through international conferences like I/ITSEC and SpaceCom and collaborations with Accenture, Siemens, and MIT, we expand our reach and foster long-term connections in STEM.

Describe your team's goals and the progress you have made towards them to fulfill *FIRST's* Vision.

Our team aims to achieve 500+ outreach hours annually while hosting and attending at least 20 events. This year, we nearly doubled our goal, reaching 800+ hours, participating in 50+ events, and securing new sponsors. Through our initiative, "Winding Up the World," we work to expand FIRST in underserved communities. With the support of company partner Ms. Padillia, we are extending our Puerto Rico summer camps to seven schools in Central America and providing 30+ STEM kits to schools in Africa.

What impact has your team seen from your efforts described in the above question? How does your team measure impact?
Clockwork Mania promotes FIRST values through STEM education and outreach. Our robotics program helped establish PLTW engineering courses, leading to 100+ students earning Fusion 360 certifications, with 60 certified this year. We mentor elementary and middle school engineering clubs and showcase our PLTW programs to 50+ Orange County officials, including Mayor Jerry L. Demings. Impact is measured through our alumni-built tracking system, comparing outreach hours and program growth annually.
Please provide specific examples of how your team and team members act as role models within the <i>FIRST</i> community with emphasis on the past 3 years. How do you share these best practices with other teams?
Clockwork Mania is a FIRST role model in many ways. In the past 3 years, we've mentored over 7 teams & assisted 45. By participating in year-round events like International Women+Girls Day at the Daytona Museum, we have clocked 10,000+ hours of community service, displaying FIRST's community goal to motivate & share STEM ideals. We set examples for other FIRST teams by leading our local FTC league & volunteering at local events, on various levels, with an emphasis on virtual events in the past.
Describe your team's initiatives to Assist, Mentor, and/or Start other <i>FIRST</i> teams with emphasis on activities within the past 3 years.
Clockwork Mania is dedicated to expanding FIRST teams globally. In 3 years, we started 9 FTC teams and mentored 10, supporting their success. We assist 7 FTC teams at our school, with 4 reaching State. We've hosted FLL summer camps in Uzbekistan, Puerto Rico, and Florida, raising \$11,000+. We are working with Imagine Engine and Startupbootcamp with Ms. Padilla to expand FIRST in Central America in 7 different schools and partnering with Missaoaqts providing STEM kits in Soweto, South Africa.
What other initiatives have you created, grown, sustained, or participated in (<i>FIRST</i> or otherwise) to help inspire young people to be science and technology leaders and innovators? What outcomes have you seen from your efforts in the past 3 years?
Clockwork Mania has led initiatives to inspire future STEM leaders. Through Synaptic Solutions, we apply AI in medicine. Our FLL summer camps, both locally and internationally, have grown by 40% increase in students. We established PLTW programs, leading to 100+ Fusion 360 certifications. Our outreach increased team applications to 80+. Partnering with Siemens and Accenture, we've presented to 100+ interns and professionals and showcased our robot on FOX 35 and SpaceCoast TV to thousands.
Describe the partnerships and relationships that you've created with other organizations (teams, sponsors, educational institutions, government, philanthropic entities, etc.) and what you have accomplished together, with emphasis on the past 3 years.
Over the past three years, we've built strong partnerships with organizations that amplify our impact. Through the Inspired Performance Institute, we helped develop TIPP, an AI bot for trauma therapy, planning to be set for clinical trials at the University of Minnesota. With Accenture, we designed a CubeSat for the MIT Satellite Challenge, using AI to assist first responders in flood disasters. These collaborations highlight how we apply robotics to real-world challenges, benefiting millions.
Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, <i>FIRST</i>, and your communities.
Thanks to our diverse community, 80% of our team are racial minorities and 35% are female. To promote inclusion, we founded a Women in Engineering club and an Aerospace club, partnering with Embry-Riddle University's Astrophysics Research Club for student research. We attend Día de Ciencias at UCF to expand FIRST in Latin communities. We host FLL summer camps in Puerto Rico, Uzbekistan, and Florida, working with Imagine Engine, Startupbootcamp, and Missaoaqts to grow FIRST globally.

Explain how you ensure your team and the initiatives you have created will be sustainable.	
We ensure sustainability through FLL summer camps for 3rd-8th graders, raising \$11,000 to support our program. Our early interview process in August helps recruit new members. We hold regular monthly meetings with parents, sponsors, alumni, and partners. An alumni-built system tracks impact, while weekly workshops ensure skill growth. Grants cover 60% of funding, with consistent applications and reports. Mid-year reports securing \$6,000-\$10,000 in school support annually depending on the need.	
Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.	
As Clockwork Mania grows, limited workspace makes it challenging to accommodate all subteams. To resolve this, we schedule weekly subteam lab meetings. To improve communication, we created a Captain's group chat and held weekly in-person meetings. Tracking outreach impact was difficult, so an alumni-built system now records hours annually. To secure long-term funding, we research grants in the offseason, track finances, and submit reports to sponsors and our school.	
Briefly describe other matters of interest to the <i>FIRST</i> Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique, particularly noteworthy, or had a large impact.	
Clockwork Mania, a small charter school team, fosters a close-knit community among students, parents, and mentors. Our robotics captains visit all OSS campuses, strengthening outreach. A parent connection with Accenture led to our CubeSat project for the MIT Satellite Challenge. Featured in our research poster, this AI-integrated CubeSat uses CNNs for real-time flood detection, providing critical disaster response data and showcasing STEM's real-world impact.	
Judge Feedback	
	Is there something more you wished we went in more detail with or would like to see more to improve our presentation? An area the team has an opportunity to improve. Something that really impressed the judges.
Essay	
Clockwork Mania 4013 – Making the Clock Work Our world is rapidly evolving, with technological advancements reshaping education, industry, and daily life. As the demand for a skilled workforce grows, so does the need for accessible STEM education. At FRC 4013 Clockwork Mania, we are committed to expanding STEM accessibility & spreading FIRST's core values across our school, community, and beyond. Thanks to our FLL summer camps and outreach, we received over 80 applications this year, showing increased STEM interest at our school. Our diverse student-led structure ensures new members are mentored by veterans, while alumni support leadership, outreach, and sustainability. We run annual workshops in business, CAD, coding, machining, and outreach, equipping students with skills essential for STEM careers. Beyond robotics, we sustain and expand FIRST's mission through our three-part outreach program, "Making the Clock Work," which engages local communities through STEM education, partners with media and professionals to advocate for robotics, and expands FIRST globally by establishing teams, providing resources, and ensuring long-term sustainability. Making the Community Tick	

Our team has extensively mentored and supported FIRST teams, hosting over 40 events and assisting 312+ teams worldwide. In the past three years, we have started 40 FIRST teams and mentored 47, providing guidance on funding, technical development, and sustainability. To expand STEM access, we donated \$6,000 in LEGO Mindstorm kits, distributing 13 to Boys & Girls Clubs and 7 to school STEM programs, fostering early interest in coding, mechanical design, and automation.

At our own school, we played a pivotal role in influencing the administration to establish an Engineering Academy, inspiring one-third of our high school students to pursue an engineering pathway. Additionally, we developed an Autodesk CAD Certification testing center, giving students access to industry-recognized training that prepares them for careers in STEM. As a result, our program has maintained a 100% college acceptance rate, with alumni attending MIT, Georgia Tech, Johns Hopkins, and UF. Our students also secure internships and career opportunities with organizations like Northrop Grumman, Procter & Gamble, VEI Systems, Altec Industries, and the U.S. Space Force, ensuring that their FIRST experiences translate into real-world career success.

We have also opened our workshop to 7 FTC teams, offering fabrication tools, programming resources, and mentorship. Last year, we launched FTC team 27188 Fractal Fusion, and this year, we started another, ensuring students have the resources to compete and innovate. Our impact was clear this season, with 4 of our 7 FTC teams advancing to the state championships, reflecting the effectiveness of our training programs.

Our FLL summer camps have educated 75+ middle school students, fostering interest in engineering and innovation while raising over \$11,000 to sustain outreach programs. Recognizing the need for more women in STEM, we founded the Women in Engineering Club and Aerospace Club, creating an inclusive space for students to explore engineering, space science, and leadership. Through a partnership with Embry-Riddle University's Astrophysics Research Club, students engage in astrophysics research, space-related careers, and STEM collaborations, further strengthening our STEM ecosystem while breaking barriers for women and minorities in STEM.

Meshing with Public Figures

FIRST is about more than building robots—it's about creating a culture where STEM is celebrated and accessible to all. As part of our mission to elevate STEM education and outreach, Clockwork Mania has worked tirelessly to advocate for STEM at the highest levels, forging impactful relationships with industry leaders, corporations, government officials, and the media. Through our efforts, we have reached over 10 million people, with features in Latina Magazine, FOX 35, SpaceCom TV, Universal Creative, and numerous STEM news platforms. These media appearances have allowed us to amplify the message of FIRST, inspiring students and communities to explore STEM opportunities they may not have otherwise considered.

Our partnership with Accenture has been one of our most transformative collaborations. Together, we developed a CubeSat for MIT's Satellite Challenge, a project that combines artificial intelligence and space technology to address real-world disaster response needs. The CubeSat is designed to assist first responders during flood disasters, utilizing machine learning algorithms to analyze satellite imagery in real-time. By integrating AI and computer vision, the CubeSat can rapidly assess affected areas, providing emergency teams with critical data to optimize relief efforts. This initiative not only demonstrates our technical expertise but also highlights how STEM can be used for humanitarian impact.

Beyond space technology, our collaboration with the Inspired Performance Institute led to the development of TIPP AI, an advanced trauma-informed AI bot designed to assist individuals suffering from PTSD, anxiety, and other psychological challenges. This initiative was inspired by our belief in the intersection of STEM and the medical field, and it embodies our commitment to using engineering and AI for social good. The TIPP AI bot leverages natural language processing (NLP) and machine learning algorithms to provide personalized cognitive interventions, helping patients manage stress, trauma, and improve mental resilience. Currently, TIPP AI is preparing for clinical trials at the

University of Minnesota, an important step toward integrating AI-driven therapy into real-world mental health treatment.

In addition to these large-scale projects, we have continued to advocate for STEM education by engaging with local policymakers and educational institutions. We have hosted robotics demonstrations for Orange County Public Schools Board members, emphasizing the importance of hands-on STEM learning and curriculum integration. Our presentation at Siemens' Innovation Center allowed us to showcase our engineering work to hundreds of professionals, both in person and online, further solidifying our role as a leader in student-driven innovation.

These collaborations and public engagements reinforce our core belief that STEM should be accessible, impactful, and integrated into real-world problem-solving. Through our work with Accenture, the Inspired Performance Institute, MIT, and Siemens, we continue to bridge the gap between technology and humanitarian efforts, proving that FIRST is more than just robots—it's about shaping the future of innovation and making a tangible difference in people's lives.

Winding Up the World

Our outreach goes far beyond our school and local community. We are committed to making STEM education sustainable, scalable, and globally accessible, ensuring that students worldwide have the tools and resources they need to succeed in STEM fields. Our commitment to this mission has led us to develop international partnerships, establish new FIRST programs, and expand STEM education into underserved regions.

Clockwork Mania has made a significant global impact by expanding FIRST and STEM education internationally. In Uzbekistan, we established and continue to support an FLL program serving over 120 students, providing them with robotics kits, mentorship, and curriculum guidance to ensure the program's long-term success. Similarly, in Puerto Rico, we launched an FLL summer camp that has grown to include over 50 students, fostering STEM interest and preparing students for FIRST competitions and future engineering careers.

Through our collaboration with Ms. Padillia, we are extending our Puerto Rico summer camps to seven schools in Central America, a major step in ensuring sustained STEM education across the region. These programs will introduce hundreds of students to engineering, robotics, and programming, allowing them to develop foundational STEM skills that will open doors to future opportunities. In addition to hands-on teaching, we are providing over 30 STEM kits to schools in Central America and Africa, equipping classrooms with the resources necessary for students to engage in robotics education.

Our outreach has also extended into South Africa, where we partnered with Missãoaqts to provide STEM kits to students in Soweto. By supplying resources and educational materials, we are ensuring that students in underprivileged communities have access to quality STEM education. Our work in South Africa reflects our belief that innovation and knowledge should not be limited by geography or economic status, and we are dedicated to continuing to bridge the gap in STEM accessibility worldwide.

Additionally, we participate in global STEM exhibitions to promote engineering, innovation, and robotics on a global scale. We present at I/ITSEC, MakerFaire, SpaceCom, SparkFest and Otronicon, reaching over 200,000 attendees and introducing thousands of students to FIRST robotics and STEM education. Through our international partnerships, outreach programs, and STEM resource donations, we are ensuring that FIRST and STEM education reach students regardless of socioeconomic or geographical barriers. By expanding into Central America, Africa, and South Asia, we are winding up the world—one student, one school, and one country at a time.

Conclusion

Clockwork Mania's commitment to STEM accessibility, outreach, and sustainability has resulted in over 10,000 hours

of community service, countless student success stories, and a growing global network of STEM leaders. We continuously strive to inspire, mentor, and create opportunities for students across our community and around the world. Just as the smallest gear keeps the clock working, every effort matters. With FIRST as our foundation, we are winding up the world, one innovation at a time. ;

